

WHAT IS CLAIMED IS:

1. An image transfer method comprising:
 - neutralizing a surface potential of an image bearing element that carries a toner image;
 - 5 controlling a surface potential of a transfer medium so that toner is not transferred from the image bearing element to the transfer medium at an upstream of a contact area between the image bearing element and the transfer medium; and
 - transferring a plurality of toner images of different colors from 10 the image bearing element repeatedly to the transfer medium to form a superposed toner image on the transfer medium.
2. The image transfer method according to claim 1, wherein the transfer medium is either of a belt and a drum, further comprising:
 - 15 transferring the superposed toner image on to a recording medium.
3. An image transfer method comprising:
 - neutralizing a surface potential of each of a plurality of image bearing elements that carry toner images made from toners of different colors;
 - 20 controlling a surface potential of a transfer medium so that the toners are not transferred from the image bearing element to the transfer medium at an upstream of a contact area between the image bearing element and the transfer medium; and
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transferring the toner images from the image bearing elements to the transfer medium to form a superposed toner image on the transfer medium.

5 4. The image transfer method according to claim 3, wherein the transfer medium is either of a belt and a drum, further comprising:

transferring the superposed toner image on to a recording medium.

10 5. An image forming method comprising:

forming an electrostatic latent image on an image bearing element;

forming a toner image from the electrostatic latent image using toner;

15 neutralizing a surface potential of the image bearing element that carries the toner image;

controlling a surface potential of a transfer medium so that the toner is not transferred from the image bearing element to the transfer medium at an upstream of a contact area between the image bearing

20 element and the transfer medium; and

transferring a plurality of toner images of different colors from the image bearing element repeatedly to the transfer medium to form a superposed toner image on the transfer medium.

6. The image forming method according to claim 5, wherein the transfer medium is either of a belt and a drum, further comprising:

transferring the superposed toner image on to a recording medium; and

5 forming a final image by fixing the superposed toner image on the recording medium.

7. The image forming method according to claim 5, wherein the surface potential of the image bearing element is neutralized by

10 irradiating a light.

8. The image forming method according to claim 7, wherein

the neutralization by the light irradiation is carried out using a light emitting device, wherein the light emitting device includes a light

15 emitting diode, a laser diode, and a xenon lamp, and

the surface potential of the image bearing element is controlled by controlling an amount of the neutralization by adjusting an amount of a light emission based on a relation between the amount of a light emission and a current flowing in or a voltage applied to the light

20 emitting device.

9. The image forming method according to claim 5, wherein the

surface potential of the image bearing element is neutralized by supplying ions emitted from an ion generating device.

10. The image forming method according to claim 9, wherein the ion generating device is either of a corotron and a scorotron.

11. The image forming method according to claim 5, wherein the
5 charge neutralization takes place after forming the toner images on the image bearing element and before transferring the toner images to the transfer medium.

12. The image forming method according to claim 5, wherein
10 the surface potential of the transfer medium has same polarity as a toner potential on the image bearing element, and an absolute value of the surface potential of the transfer medium is equal to or greater than an absolute value of the toner potential.

15 13. The image forming method according to claim 12, wherein the surface potential of the image bearing element is controlled by applying a potential to a conductive element that is disposed in contact with a back of the transfer medium.

20 14. The image forming method according to claim 13, wherein a shape of the conductive element is a roller.

15. The image forming method according to claim 13, wherein a shape of the conductive element is a plate.

16. The image forming method according to claim 13, wherein a shape of the conductive element is a brush.

17. The image forming method according to claim 12, wherein the
5 surface potential of the transfer medium is controlled by charging a surface of the transfer medium at the upstream of the contact area.

18. The image forming method according to claim 17, wherein the transfer medium is charged by a scorotron.

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19. The image forming method according to claim 17, wherein the transfer medium is charged by applying a voltage to a contact conductive element that rotates at same speed as the transfer medium.

15 20. The image forming method according to claim 17, wherein the transfer medium is charged by applying a voltage to a non-contact conductive element.

21. The image forming method according to claim 5, wherein an
20 amount of charge neutralized from the image bearing element is controlled based on information of the image that is formed on the image bearing element.

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22. The image forming method according to claim 5, wherein the surface potential of the transfer medium is controlled based on information of the image that is formed on the image bearing element.

5 23. The image forming method according to claim 5, wherein a transfer bias potential applied to the transfer medium is controlled based on information of the image that is formed on the image bearing element.

10 24. The image forming method according to claim 5, wherein neutralization of the surface potential of the image bearing element and control of the surface potential of the transfer medium are executed from the time of transferring a toner image of a third color when superposing and the toner images.

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25. The image forming method according to claim 5, wherein a degree of roundness of the toner is equal to or more than 0.94.

26. An image forming method comprising:

20 forming electrostatic latent images on a plurality of image bearing elements;

forming toner images from the electrostatic latent images using toners of different colors;

neutralizing a surface potential of each of the image bearing

25 elements that carry the toner images;

controlling a surface potential of a transfer medium so that the toners are not transferred from the image bearing elements to the transfer medium at an upstream of a contact area between the image bearing elements and the transfer medium; and

5 transferring the toner images from the image bearing elements to the transfer medium to form a superposed toner image on the transfer medium.

27. The image forming method according to claim 26, wherein the
10 transfer medium is either of a belt and a drum, further comprising:

transferring the superposed toner image on to a recording medium; and

forming a final image by fixing the superposed toner image on the recording medium.

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28. The image forming method according to claim 26, wherein the surface potential of the image bearing element is neutralized by irradiating a light.

20 29. The image forming method according to claim 28, wherein the neutralization by the light irradiation is carried out using a light emitting device, wherein the light emitting device includes a light emitting diode, a laser diode, and a xenon lamp, and the surface potential of the image bearing element is controlled
25 by controlling an amount of the neutralization by adjusting an amount of

a light emission based on a relation between the amount of a light emission and a current flowing in or a voltage applied to the light emitting device.

5 30. The image forming method according to claim 26, wherein the surface potential of the image bearing element is neutralized by supplying ions emitted from an ion generating device.

10 31. The image forming method according to claim 30, wherein the ion generating device is either of a corotron and a scorotron.

15 32. The image forming method according to claim 26, wherein the charge neutralization takes place after forming the toner images on the image bearing element and before transferring the toner images to the transfer medium.

33. The image forming method according to claim 26, wherein the surface potential of the transfer medium has same polarity as a toner potential on the image bearing element, and
20 an absolute value of the surface potential of the transfer medium is equal to or greater than an absolute value of the toner potential.

34. The image forming method according to claim 33, wherein the surface potential of the image bearing element is controlled by applying
25 a potential to a conductive element that is disposed in contact with a

back of the transfer medium.

35. The image forming method according to claim 34, wherein a shape of the conductive element is a roller.

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36. The image forming method according to claim 34, wherein a shape of the conductive element is a plate.

37. The image forming method according to claim 34, wherein a
10 shape of the conductive element is a brush.

38. The image forming method according to claim 33, wherein the surface potential of the transfer medium is controlled by charging a surface of the transfer medium at the upstream of the contact area.

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39. The image forming method according to claim 38, wherein the transfer medium is charged by a scorotron.

40. The image forming method according to claim 38, wherein the
20 transfer medium is charged by applying a voltage to a contact conductive element that rotates at same speed as the transfer medium.

41. The image forming method according to claim 38, wherein the transfer medium is charged by applying a voltage to a non-contact
25 conductive element.

42. The image forming method according to claim 26, wherein an amount of charge neutralized from the image bearing element is controlled based on information of the image that is formed on the
5 image bearing element.

43. The image forming method according to claim 26, wherein the surface potential of the transfer medium is controlled based on information of the image that is formed on the image bearing element.

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44. The image forming method according to claim 26, wherein a transfer bias potential applied to the transfer medium is controlled based on information of the image that is formed on the image bearing element.

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45. The image forming method according to claim 26, wherein neutralization of the surface potential of the image bearing element and control of the surface potential of the transfer medium are executed from the time of transferring a toner image of a third color when
20 superposing and the toner images.

46. The image forming method according to claim 26, wherein a degree of roundness of the toner is equal to or more than 0.94.

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47. An image forming apparatus comprising:

an image bearing element;

a latent image forming unit that forms an electrostatic latent image on the image bearing element;

5 a developing unit that develops the electrostatic latent image to form a toner image on the image bearing element using toner;

a transfer unit that transfers the toner image on to a transfer medium, wherein the transfer unit transfers a plurality of toner images of different colors from the image bearing element repeatedly to the

10 transfer medium to form a superposed toner image on the transfer medium;

a neutralizing unit that, when the toner image is transferred, neutralizes a surface potential of the image bearing unit; and

a control unit that controls a surface potential of the transfer

15 medium so that the toner is not transferred from the image bearing element to the transfer medium at an upstream of a contact area between the image bearing element and the transfer medium.

48. The image forming apparatus according to claim 47, wherein the

20 transfer medium is either of a belt and a drum, further comprising:

a secondary transfer unit that transfers the superposed toner image on to a recording medium; and

a fixing unit that fixes the superposed toner image transferred on to the recording medium.

49. An image forming apparatus comprising:

- a plurality of image bearing elements;
- a plurality of latent image forming units that form electrostatic latent images on the image bearing elements;

5 a plurality of developing units that develop the electrostatic latent images to form toner images on the image bearing elements using toners of different colors;

- a transfer unit that transfers the toner images on to a transfer medium, wherein the transfer unit transfers the toner images of different

10 colors from the image bearing elements repeatedly to the transfer medium to form a superposed toner image on the transfer medium;

- a neutralizing unit that, when the toner image is transferred, neutralizes a surface potential of the image bearing unit; and
- a control unit that controls a surface potential of the transfer

15 medium so that the toner is not transferred from the image bearing element to the transfer medium at an upstream of a contact area between the image bearing element and the transfer medium.

50. The image forming apparatus according to claim 49, wherein the

20 transfer medium is either of a belt and a drum, further comprising:

- a secondary transfer unit that transfers the superposed toner image on to a recording medium; and
- a fixing unit that fixes the superposed toner image on the recording medium.

51. The image forming apparatus according to claim 49, further comprising:

cleaning units that clean the image bearing elements and collects residual toner left untransferred; and

5 a toner recycling unit that returns the toner collected in the toner cleaning units to the developing units.